

## A SURVEY OF ETHNOPHARMACOLOGY OF SINGLE HERBAL PREPARATIONS OF MEDICINAL PLANTS IN ASENDABO DISTRICT, JIMMA

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### ABSTRACT

Medicinal plants have been used to prevent and treat various health problems. Several African and Asian nations are now encouraging traditional medicines as an internal component of their public health care programs. Indigenous medicines are relatively inexpensive and locally available and readily accepted by local population. Ethiopia has an enormous resource of plant species that are used in Traditional medicine. Among the 7000 higher plants species that are known to exist about 800 of them are employed in the traditional health care and 60% of plants are said to be indigenous with their healing potential. Majority of Ethiopians depend on medicinal plants as their only source of health care especially in rural areas where access to villages is lacking due to absence of vehicular roads. Vast knowledge on the traditional uses of these plants is not fully documented and most of the knowledge is conveyed from one generation to the next generation through words of mouth, especially in countries like Ethiopia. Thus the present survey is undertaken to explore the traditional systems of medicine in Asendabo region of Ethiopia. The survey was conducted from February 28 - May 5, 2006.

**KEYWORDS:** Ethiopia, Medicinal plants, WHO report, Traditional medicines, formulation

### INTRODUCTION

Majority of the people on this world still rely on traditional medicines for their everyday health care needs. It is also a fact that one quarter of the medicinal prescriptions are formulations based on substances derived from plants or plant derived synthetic analogs and according to the WHO report 80% of the world's population, primarily those of developing countries, rely on plant derived medicines for their health care. Peoples who use traditional remedies may not understand the scientific rationale behind their medicines, but they know from personal experience that some medicinal plants can be highly effective if used at therapeutic doses (1).

People in industrialized countries were seeking herbal medicine because of the fear of severe adverse effects of modern medicine. People believed that plant remedies used for medication are less toxic than modern medicines, more over they seek plant remedies to satisfy their high demand on secondary plant metabolites in drug discovery (2).

In sub-Saharan Africa, thousands of kilograms of medicinal plants are collected and used by healers for treatment of different human and live stock diseases. (3) Ethiopian TM is composed of a number of skills such as use of plants, animal products and minerals as well as magic and suppression. It is also true in urban population, for instance, in Addis Ababa, where modern health service is relatively better; a significant percentage of the population has been using TM. Social belief and various socio cultural reasons in Ethiopia made majority of the people continue to rely on indigenous remedies. The indigenous knowledge about many of medicinal plants has justified its existence by the biomedical benefits that have been established through observations of generations of people. This is demonstrated by the history of modern drug discovery from plants, which were employed in TM in other countries such as China and India (4).

Ethiopia has an enormous resource of plant species that are used in TM. Among the 7000 higher plants species that are known to exist about 800 of them are employed in the traditional health care and 60% of plants are said to be indigenous with their healing potential (4, 5). Majority of Ethiopians depend on medicinal plants as their only source of health care especially in rural areas where access to villages is lacking due to absence of vehicular roads.

Provision of modern health care through the construction of new hospitals, health centers and health posts, imported drug supplies and training of doctors and nurses are of little value at present time to the majority of the rural population (in excess of 40 million people). Medicinal plants and knowledge of their use provide a vital contribution to human and live stock health needs through out the country (6).

The increasing demand by the industrial courtiers for herbal remedies has put increasing pressure on the supply of raw materials available in developing countries. The enormous demand for medicinal plants is generally met by indiscriminate harvesting of the natural flora. As result many useful indigenous plant species are, therefore gradually disappearing due to deforestation and over consumption. Like many other countries cultivation of medicinal plants is not yet wildly practiced in Ethiopia. This scarcity of medicinal plant species causes traditional healers long distance to go for collection (7).

Vast knowledge on the traditional uses of these plants is not fully documented and most of the knowledge is conveyed from one generation to the text generation through words of mouth, especially in courtiers like Ethiopia. The danger of losing valuable information is thus high considering the increasing acculturation, mobility and displacement of communities due to several factors, Moreover traditional healers have passed on their knowledge only to the members of their own family or apprentice considered to be “elect” under “oath” this practice of secretive transfer of information accompanied with the negligence of contemporary generation due to expansion of modern education and to some extent modern medicine has left traditional healers in a condition where they could hardly find successors(8). Like many other Ethiopians, the Asendabo people use medicinal plants for their primary health care. Ethinopharmacologically, these people have remained unexplored and there is no comprehensive accounting of their traditional medicinal practices. As it is happening else where in the country, both the traditional knowledge and plants utilized by these people are under threat due to the aforementioned reasons. Plants have formed the basis of sophisticated traditional medicinal systems that have been in existence for thousands of years and continue to provide mankind with new remedies. The modes of therapy of these herbal remedies are based on empirical of findings. Natural products and their derivatives represent more than 50% all the drugs clinically used in the world and higher plants contribute not less than 25% of the total natural products (9).A survey of medicinal plants in Indonesia was done in three tribes and 182 medicinal plants were collected for 45 health problems in Melayu tribe, 110 in Talang Mak for 58 cases and 101 medicinal plants for 54 cases in Anak Dalam tribe. The leaf part of the plant mostly used for preparation of remedies and delivers the active ingredients. Usually the leaves were boiled with water and taken orally, accounting for 199 traditional medicinal plants (10).80% of Mali population used traditional medicinal plants as their only source of medicine. Official medicinal attention is usually based on commercial drugs that have to be purchased with money while TM consultancy has a much lower cost. The majority of the remedies were prepared in the forms of decoction that account (65%), followed by infusion (13%) in which powders are used and maceration (11%) where roots are employed for preparation. Also, it was reported that most of the remedies were taken orally (11). Thus the present study was undertaken to study important medicinal plants used as single herbal prescription in Asendabo district of South West Ethiopia.The survey was carried out from Feb 28 May 05-2006.

## METHODS AND MATERIALS

### Study area and period.

Asendabo District is one of the Districts in Jimma Zone. It is 50 km away from Jimma town and 291km south West of Addis Ababa. It has 9 kebeles with total area of 1589.4 km<sup>2</sup>, It has four climatic zones: wurch (0.03%), dega (23.4%), woyna dega (62.72%) and kola (13.8%), with the altitude ranging from 880-3344 meters above sea level; annual rainfall ranging from 900-6000mm and temperature ranging from 27—32°C. The topography consists of mountains (12%), hills (20%) and plains (68%). Fifteen percent of area is covered by forest and 85% is used for agriculture (12).

### Study design

Across-Sectional study was conducted to document indigenous Knowledge on medicinal plants. A structured questionnaire was used to collect ethinopharmacological information from healers.

#### Population

##### Source population

People who live in Asendabo District of Jimma Zone.

##### Study population

All healers in Asendabo District.

##### Sampling and sampling technique.

All healers in the district were included in the survey. The healers were identified with help of community leaders and administrators of the kebeles.

##### Study variables

##### Independent variables

- Age
- Sex
- Ethnicity
- Religion
- Education status
- Economic status

##### Dependant variables

- Use of medicinal plants
- Plant parts used
- Formulation (method of preparation)
- Route of administration
- Disease treated.

##### Data Collection

This Ethinopharmacological study was conducted among the healers about their knowledge on the medicinal plants and mode of practice by using a well-structured questionnaire, which was prepared in English and translated to Amharic at the time of interview. The questionnaire had the following components: Socio-demographic data, diseases treated by the healers, years of experience source of knowledge, information on medicinal plants such as parts of plant used and plant habitat methods of preparation. Specimen of the medicinal plants were collected and pressed for identification and documentation. Before data collection, the questionnaire was pre tested and necessary corrections were made.

##### Quality control of Data

The quality of data was assessed by checking the performances of data collectors in filling questionnaires with legible and easy words, completeness, and accuracy by the principal investigator. If there would be omission of questions and incompleteness, it was corrected during data clearance. Moreover the healers were interviewed twice in order to get more reliable information. In addition the principal investigator (PI) was visited some of the healers to be sure on the interviewers' responsibility.

#### RESULTS

The study was carried out successfully. The socio-demographic characteristics of traditional healers is shown in Table 1. In the survey a total of 40 medicinal plants were collected. Majority of them were identified and few were not identified. The identified species were distributed in 42 families of which Solanaceae, Antiraceae, Euphorbiaceae, Labiatae, Ranunculaceae, Rutaceae, Verbenaceae, and Acanthaceae were the major families used for herbal preparation. The result is shown in table 2.

Table 1: Socio-demographic characteristics of traditional healers in Assendabo District.

Background characteristics	Frequency	Percent
Sex		
Male	7	63.6%
Female	4	36.3%
Age		
30-39	2	16.6%
40-49	5	41.6%
50-59	3	25%
≥60	2	16.6%
Ethnicity		
Oromo	6	42.8%
Dawaro	2	16.6%
Amhara	4	28.5%
Kullo	1	7.14%
Religion		
Muslim	8	72.7%
Christian	3	27.2%
Educational status		
Illiterate	7	38.8%
Church education	5	27.7%
Literacy campaign	3	16.6%
Grade 1-6	2	11.1%
Grade 7-8	1	5.5%
Occupational status		
Farmers	10	62.5%
Merchant	5	31.25%
Government employee	1	6.25%
Years of experience		
5-10	4	28.57%
11-15	2	14.28%
16-20	5	35.75%
24-25	2	14.28%
≥25	1	7.14%

Table 2: Plant used as single herbal prescription in Asendabo district

Vernacular	Scientific name	Family name	Indications & No of satiations	Part used	Preparations and administration
Reje <sup>O</sup>	<i>Veronica auriculifera</i> Hein	Asteraceae	Chancroid (1) Wound (2)	W L	Pounded plant is macerated in water and the filtrate drunk. The leaves are squeezed and the juice applied on the wound.
Armagusa <sup>O</sup>	<i>Ajuga integrifolia</i> Ham.Buch	Lamiaceae	Diarrhea (3) Jaundice(ye'mariyam-mekent) (2)	W	Whole plant is pounded: soaked in hot water and the filtrate drunk
Dumuga <sup>O</sup>	<i>Justilia schimperand</i> (Hochst ex Nees) T. Alnder.	Acanthacea	Goha-besheta (1)	L	The fresh leaves are squeezed and the juice taken: the residue is rubbed on the genitalia
Kelala <sup>O</sup>	<i>Stephania abyssinica</i> (Dillonet A. Rich) walp	Menis permaceae	T.Corporise (1)	W	The plant is pounded and applied to whole body.
Catto <sup>O</sup>	<i>Albizia schimperiaha oliu</i> .	Fabaceae	Facial fungus (chirete) (2)	L	The dried powdered leaves are mixed with better and applied on the affected area
Papaya <sup>A</sup>	<i>Cerica papaya</i>	Caricaceae	Ameba (3), gardia (3), Malaria (6)	S L	The seeds are pounded and the powder mixed with honey and taken. The fresh leaves are soaked in warm water and the filtrate taken.
Kobbo <sup>O</sup>	<i>Ricins communis</i>	Euphorbiaceae	Ameba (2)	R S	The fresh root is pulverized and mixed with garlic and honey and taken. The seeds are chewed and swallowed.
Ye'mariyam <sup>A</sup> mekent			Juandice(2)	L	The dried leaves are pounded and the powder dispersed in cup of tea and taken.
Baruda <sup>O</sup>			Tonsilitis (2)	R	The fresh roots chewed and the juice is for garglation.

(Note; L-leaf, R- root B-bark, s -seed, St-stem, La-latex, F –flower, Bb-bulb, O-Afan oromo, A-Amharic

Table 2 continued

Harbu <sup>o</sup>	<i>Ficussur foresee</i>	Moraceae	Eczema ( <i>chiffa</i> ) (2)	La	The fresh latex of the leaves are applied on the affected
Damakese <sup>A</sup>	<i>Ocimum lamiifolium</i>	Labiatae	Uv-skin reaction ( <i>mitchi</i> ) (4)	L	The leaves are soaked in warm water and the filtrate taken: the vapor for fumigation.
Ye'seythen kill <sup>A</sup>	<i>Lagenarin abyssinica</i> (Hoof.f) c.Jeffery.	cucurbitaceae	Epilpsy ( <i>ye'methele besheta</i> ) (2)	L	The leaves are squeezed and the juice applied to nose: the residue is subbed on the nose.
Lagiya <sup>o</sup>			Tuberculosis ( <i>ye'sameba-nekersa</i> ) (2)	R	The dried roots are powdered and the powdered dispersed in to cup of tea and taken
			Rabies ( <i>ye'wusha beshea</i> ) (2)	R	The dried roots powdered and the mixed with barley powder and water is poured in to the powder to make moist mast.
Botetesa			Hemorriod ( <i>kintarote</i> ) (3)	R	The fresh roots are pounded and mixed with honey and taken.
Mareyata <sup>A</sup>	<i>Dodonea angusti folia</i> L.f.	Sapinaceae	( <i>madiate</i> ) (2)	W	The plant is pounded and applied on the face.
Oumugulian			Gonnerria ( <i>chebete</i> ) (1)	S	The dried seed are pounded the powder is dispersed in water and taken.
Hidda <sup>o</sup>	<i>Clematis hirsute</i> perr and Gull	Ranunculaceae	Ameba (2)	R	The dried seeds are pounded and the powder is dispersed in water and taken.

Table 2 continued

zingible <sup>A</sup>	<i>Zingier offcinal</i> ross	Zingiberaceae	Abdominal cramp ( <i>Hode-kurthet</i> ) (3)	Rh	The fresh rhizomes are pounded and macerated in warm water and the filtrate Taken.
Shenfa <sup>o</sup>	<i>Lepidium satvuim.</i>	Cruciferceae	Renal diseases (1)		The powdered seeds are mixed with honey and taken.
Oricha-ferengy <sup>o</sup>			Gonnerria(1)	S	The dried seeds are powered, dispersed in water and taken.
Chkugn <sup>o</sup>	<i>Artemisa abyssinica</i> Schtz Bipex Rich	Compositceae	Evil eye(2)	S	The seeds are powered and dispersed in tea and taken.
Tufo <sup>o</sup>	<i>Ageratum conyzoides</i>	Asterceae	Eipithaxis ( <i>ye'ne ser</i> )(3)	L	The pounded leaves are applied on the nose.
Ludetta <sup>o</sup>			Goitor (1)		The fresh-pounded plant part is squeezed and the juice taken: the residue is rubbed on the neck.

Table 2 continued

Dechi Merecha <sup>o</sup>			Evil eyes (2) (ye'buamedanite)	L	The fresh leaves are squeezed and the juice is diluted with water for drink.
Ye' feres-zeng <sup>A</sup>	<i>Otostegia inter grifolia</i> Benth	Lamiaceae	Ascaris (1)	R	The powdered dried roots pounded and the juice is taken
Ye' mider enboyi <sup>A</sup>	<i>Cucumis ficifolius</i>	Solanaceae	Ya' menmene besheta (1)	R	The powdered dried roots are mixed with cow milk and taken.
Tarigum <sup>o</sup>			Epilepsy (1)	R&L	Fresh pounded leaves and roots are infused in water for 7 days and taken.
Ketetinna <sup>o</sup>	<i>Verbascum siniaiticum</i> Benth.	Scrophulariaceae.	"Mister ye'meyasewota" (1)	F	Fresh flower squeezed and the juice is applied on the forehead as a symbol of class.
Ye'shankila <sup>A</sup> medhanit			Wound (2)	L	The fresh-pounded leaves squeezed and the juice is taken.
Attuch <sup>A</sup>	<i>Verbena officinalis</i> L.	Verbenaceae	Hode- kurtete(4) Ameba (3) Back pain (3)	R	The fresh leaves are chewed with salt and the juice is taken.
Emboyi <sup>A</sup>	<i>Solanum incanum</i>	Solanaceae.	Epitasis (3)	L	The powdered leaves are applied in to nose.
Anchabi o	<i>Calpurna ourea</i> (Ait.) Benth	Fabaceae	Headache (1)	L	The pounded leaves are lited with fire and the smoke inhaled.
Bottoro o			Snake bite (1)	St	The steams are ground, dispersed in water for drink.

Table 2 continued

Kuttia o			Gonorrhea ( <i>chebite</i> )(1)	L	The leaves are squeezed and the juice is taken.
Bissana <sup>A</sup>	<i>Croton macrostachys</i>	Euphorbionceae	T.corporise (3) Wound (2) Ameba (1) Blood coagulant (1)	La L L L	The fresh latex from leaves is applied on the affected area. The apexes of the plants are soaked in warm water and filtrate is taken
Kinin zafe <sup>A</sup>			<i>Hode kurthet</i> (2) Toothache (2)	L	The fresh pounded leaves juices poured in to tea and taken.
Tosegn <sup>A</sup>	<i>Thymus serrulatus</i>	Labiatae	Renal diseases (5) Hypertension (1) T.capities (1)	L	The fresh leaves are soaked with warm water and the filtrate drunk. The fresh leaves are macerated in water for three days and the juice is applied on the head.
Wanza <sup>A</sup>	<i>Cordia faricanalam</i>	Boraginaceae	T.capiies (2)	Lx	The fresh apex of plant is squeezed and the juice is applied on the head.
Berbere <sup>A</sup>	<i>Capsicum annum L.</i>	Solanaceae	Burn wound (2)	L	The fresh leaves are pounded and applied to the affected area.
Asaabella <sup>o</sup>			Skin diseases (2)		The fresh-pounded seed juice is taken: the residue is rubbed on the skin.
Edndod	<i>phytolacca dodecan dra</i> L Herit	Phytolaccaeae	Eczema (3)	L&F	The fresh pounded leaves and flower juice is applied on the affected area.



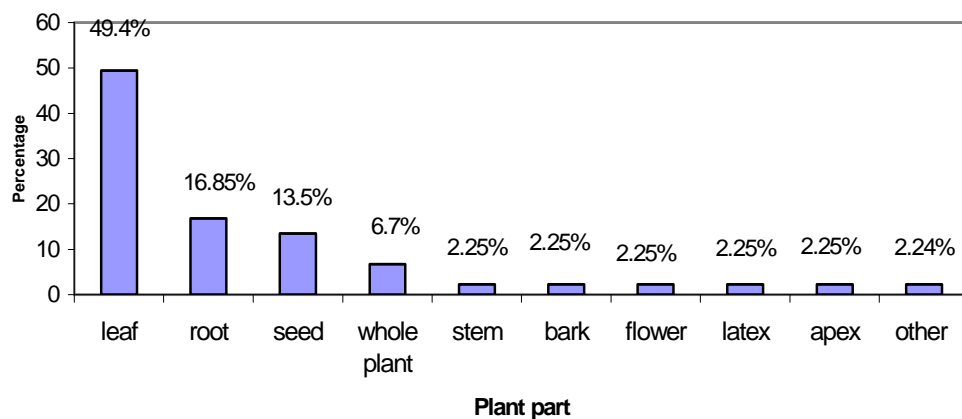


Figure 1: Comparison of plant parts used as a source of medication In Asendabo District

As indicated in figure 1 the most widely sought after plant part for preparation of remedies in the area were leaves followed by root and seed. Majority of the remedies were prepared in form of juice from freshly collected plant parts. The juice is usually prepared by pounding or crushing the plant parts by using traditional miller. Some remedies were prepared by squeezing the fresh plant and water was mostly used to dilute the juice. The majority of the preparations were of fresh plants and few remedies were prepared from dried and grounded plant parts.

Regarding on the route of administration, most of the remedies were administered orally followed by topical application and inhalation/ fumigation.

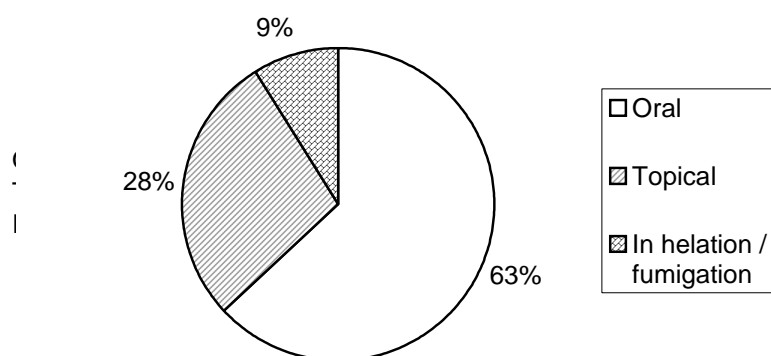


Figure 2: Comparison of Route of administration of plant remedies in Asendabo in district

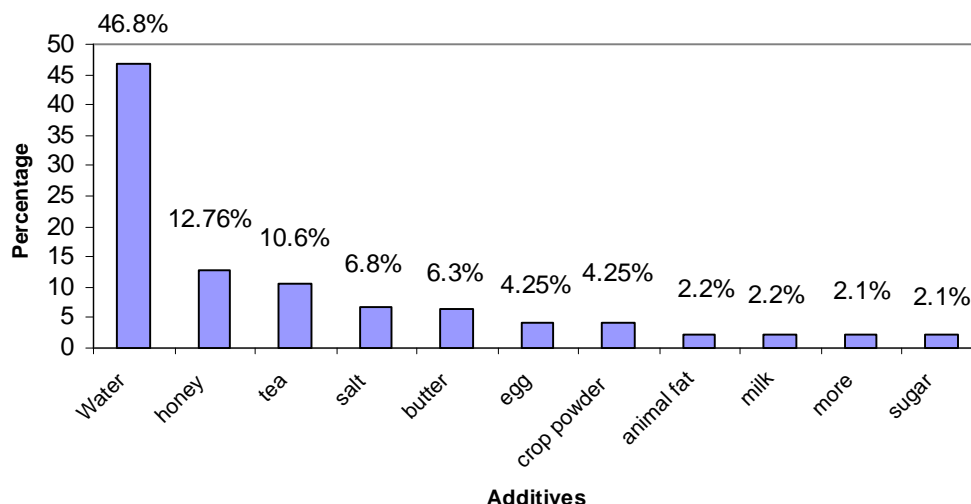


Figure 3: Additives used in the preparation of remedies in Asendabo district, Feb 28-May 5, 2005.

As indicated in figure 3, water was the most commonly used additive followed by honey, tea, salt and butter in preparation of remedies. Most of the remedies had no measurement of dose where as some were measured by use of cups.

Out of 40 types of herbal remedies some remedies had adverse effects; the most commonly occurring were nausea, vomiting gastrointestinal discomfort, diarrhea and fever. Some remedies were contraindicated for pregnant and nursing women.

## DISCUSSION

This survey indicated that family members were the major source of the indigenous knowledge in this District, like other study conducted in Jimma zone. This is due to that the healers kept the knowledge as secret with in the family members. Most of the remedies were derived from plants sources, but modern drugs and minerals were not yet used as a source of medicine (9). A study in Butajira (2003) indicated that 17.4% herbal medicines and 82.4% modern medicines were used for the treatment of different illness (2). Most of the medicinal plants utilized in this area were harvested from the wild source as in many parts of the country. A study done on Zay people also indicated that most plants were harvested from wild sources and only 6 types of species are under cultivation (8). Harvesting from wild source decreases the supply of medicines and leads to destruction of potential medicinal plant species.

The most widely sought after the plant parts in the preparation of remedies in the area was leaf part. Collecting of leaves do not pose great danger to the existence of an individual plant when compared with the collection of underground parts, stem, bark, or whole plant, According to a study conducted in Shirka district roots were highly used for herbal preparation (7).

Most of the reported preparations in the area were prepared from freshly collected juice by crushing or pounding. Other study conducted in Jimma zone (2003) reported that 62% of the remedies were prepared by boiling. Preparing plant remedies by crushing or pounding is more advantageous than using decoction or concoction, since heat could affect the active constituents of the remedies. Majority of the reported preparations in the area

were drawn from a single plant and mixtures were used rarely. A study in Seka Chekorsa (2005) reported that 33 prescription remedies were polyherbal and 20 were prepared from single plant species. The use of mixture of plant species in treating particular ailment would be for synergic interaction or potentiation effect of one plant on the other (5). Most of the remedies in the area were administered through oral route. Other study conducted in Jimma zone reported that oral route was the major route of administration (8).

In this survey water was the most commonly used additive in the preparation of remedies in many parts of the country. Water is safe and less toxic than other solvents and also its low cost and easy availability may increase its demand for preparation of remedies. Other additives such as honey, sugar, tea and salt were used as sweeteners to modify the taste of the remedies; butter and animal fats used as a base (carrier) in the formulation of topical preparations. Most of the remedies had no measurement of dose that is lack of precision in the determination of dose due to this different dose dependent adverse effects were seen.

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